The MAC Flyer

AUGUST 1981

The Midnight Special . . . page 16

The MAC Flyer

MILITARY AIRLIFT COMMAND

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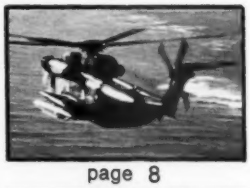

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Take Heed, Not Offense

by **Major James G. Gibson II**

The time has rolled around for me to trade in my pica pole for a Weems plotter and PCS back to the cockpit. Before I clean out my desk and hand the editorial yoke over to my successor, though, I'd like to share a thought or two with you.

After three years of studying, and in some cases agonizing over, the parade of mishap reports that marched across my desk week after week, a couple of things have become vividly apparent to me. Before I took on the challenge of editing *The MAC Flyer*, I had an opinion that I suspect many of you would agree with, namely that accident investigators are biased and out to get crewmembers. It seemed to me that they automatically identified some form of crew error as part or all of the cause of just about every flying accident. Three years of looking at the situation from a different perspective has pretty well convinced me that the sad but true fact is, they were probably right about 99 percent of the time.

Nevertheless, my pride as a crewmember kept me from accepting the idea for a long time.

Thinking back, I can recall several fatal accidents during the past three years where crews committed the most unimaginable and unforgivable aviation sin of all—they simply neglected to keep their airplanes flying safely. Their intentions may have been good, but they allowed themselves to become overly preoccupied with diversions like handling a straight forward airborne emergency, troubleshooting a mechanical malfunction, or simply looking out the cockpit window to try and spot the intended airfield. Thus engaged, these crews permitted perfectly flyable airplanes to be destroyed by crashing into hillsides, or diving or stalling past the point of safe recovery and impacting the ground. Other crews were more fortunate, and "only" dinged a wingtip or scuffed their airplane's belly when they neglected to monitor terrain closely enough, misjudged a crosswind on landing, or somehow failed to lower the gear before touchdown.

In darker moments, I have sometimes felt that there is no limit to the propensity of some aviators, and that includes both new ones and old heads alike, for recreating well-known, timeworn mistakes or coming up with unique and increasingly bizarre mishap scenarios based on familiar hazards. As a result, I now place considerably more belief in the pronouncements of accident investigators when they heap some or all of the blame for a mishap on the crew. I also have a lot less sympathy for those in our flying fraternity who go around complaining that aircrew members are being unfairly singled out for criticism.

In most mishaps, the crewmember who usually takes the lion's share of the blame is the pilot. While it is true that the pilot is ultimately responsible for what goes on aboard his airplane, some have had a lot of help meeting their "Waterloo" from crews that either did things which added to already existing problems, or did nothing when positive actions on their part could have helped stave off disaster. The operative word on most MAC airplanes is *crew*, and there are many occasions when an alert crewmember other than the pilot could have saved the day, but either joined in the confusion or remained silent.

You may be willing to concede that I have a point in some cases, but take exception to those crashes where a critical emergency or some sort of severe force of nature was involved. My answer to that challenge is quite simple. Aside from catastrophic structural failures or "acts of God," it is very seldom that our modern MAC transport aircraft don't have enough redundancy and backup systems to keep them airworthy even during multiple mechanical malfunctions. Keeping things on an even keel during those occasions is one of the biggest reasons we have aircrews on airplanes. About 95 percent of of the time our airplanes fly along just fine. If it weren't for the occasions when the bird acts up or there is a need to compensate for unforseen adverse circumstances, we could probably get the Point A to Point B flying done quite nicely with programmable "black boxes" at the controls. But computers and transistors can't reason or exceed their programmed "intelligence" limits. That's where the need for thinking human crewmembers arises.

This brings us to the bright side of the somewhat grim situation I've been discussing up until now. For every aircraft we lost or damaged due to crew deficiencies, there are many examples where alert, heads-up flyers saved their airplane when some of its systems went into crew rest prematurely during a flight. Talk to any C-141 driver who has had to cope with severe, unwanted flight control inputs lately, for example, and you'll be talking to a flyer who more than earned his or her flight pay.

When you boil it all down, what we crewmembers are all about is keeping our airplanes flying safely at all times, and especially when such factors as weather, traffic or the mechanical status are less than optimal.

The informative findings of mishap investigation boards can be a big help to all of us in avoiding the pitfalls that prevented others from staying safely aloft. So, next time you read an accident report or an article Monday-morning-quarterbacking a mishap, try and approach the conclusions of the investigators with an open mind, rather than with a chip on your shoulder. We can all learn a lot from the mistakes of others, and believe me that's just about the best and most painless way to learn—in this or any other business.

Doc Talk

Hot weather can affect the way you feel and the way you fly.

by Captain R.M. Lloyd
Flight Surgeon, 427 Squadron
Canadian Armed Forces

Lt Macigfee: Hey Doc, why do I need to get all hot and bothered every summer about heat stress?

Doc: Well, Mac, it's like this. As a crewmember, the effects of heat can degrade your performance. I think most people underestimate the problem of heat stress but it's one of those things that can creep up on you. You don't have to be stationed in the middle of the Sahara Desert either, because heat stress situations can occur even in temperate climates. Depending upon how hot it becomes in the cockpit, for instance, a crewmember may be affected after as little as 15 minutes. Missions flown for two hours or more, or repeated missions on a hot day make the occurrence of heat stress more likely.

Heat stress causes bodily discomfort initially, and that in itself may be significant if other accident-inducing factors are present for it to team up with. As body temperature rises, crewmember skills are affected, especially complicated tasks. At 103°F man's ability to perform complex tasks is hampered by twice the number of errors compared with performance at 98.6°F, the body's normal temperature. Interestingly, as people get hot they tend to perform more rapidly, but they make more mistakes. Short term memory can be affected by heat stress which can make it more difficult to copy down instructions correctly. Judgment can be impaired, as the case of one unfortunate B-52 crew illustrates. The bomber developed a fault in its heating system which went bananas and tried to roast the crew. The AC even undressed down to his undershorts.They bypassed three perfectly good airfields before finally becoming totally incapacitated and crashing. All souls on board were killed with the exception of the tail gunner who had his own heating system which was unaffected—he bailed out.

When heat stress continues to the point where body core temperature begins to rise to dangerous levels above 103.5°F, collapse, convulsions and even death can occur. Heat stress is therefore potentially very dangerous and should be treated with respect.

Macigfee: Okay, but how do I know if I'm suffering from heat stress? How do I feel?

Doc: Well, obviously you begin to feel hot. You might get a headache, feel sick, tired, lightheaded and get cramps in your muscles. You will begin to sweat profusely and your face will be red. If the heat stress continues you might begin to act strangely and have difficulty speaking. If you are flying a stressful mission requiring great concentration, you might not notice how badly you are affected until you begin to relax. The most dangerous signs are a pulse rate that becomes more rapid (over 100 beats per minute) and the cessation of sweating. The latter is the most ominous sign and indicates the onset of heat stroke which carries a very high death rate (about 25 percent). Fortunately, heat stroke is rare in the Air Force, perhaps because we take heat problems, and their avoidance and management, seriously. Nonetheless, the possibility of heat stroke evolution should always be kept in mind, and besides, inflight performance can be degraded to hazardous levels long before heat stroke occurs.

Macigfee: All right, Doc, but what causes heat stress in the first place?

Doc: Without getting into too much physics and physiology we can say simply that heat stress builds up when heat gained by the body exceeds the heat lost. Heat gain can come from high ambient temperatures; a pilot may already have begun to suffer from heat stress before even boarding the airplane if the nonflying environment is hot. It may be too hot in the cockpit because of the "green-house effect" caused by direct sunlight streaming through the flight deck windows, the heat produced by engines and avionics or, as we have seen, a malfuntioning heating system. Temperatures in the cockpit standing on a ramp on a hot day can rise to 86°F above ambient temperature which is rather like having a 2 kilowatt heater switched on inside the cockpit!

Heat loss from the body occurs in several special ways. The most important (and efficient) manner in which we lose heat is by the evaporation of perspiration—sweat to you, lieutenant. There is a limit to the amount of sweat we can produce and, interestingly, a heat-acclimatized person sweats more—not less—than a person who is not adapted. As sweat evaporates it removes from the skin the heat required for its evaporation, called latent heat of evaporation. In the process, for every 1.5 ml of sweat evaporated, 1 kilocalorie of heat is lost. (One kilocalorie is the heat required to raise the temperature of 1 liter of water by 1°C.) The maximum rate of sweat production is about 2.5 liters per hour. Clothing worn has an effect on sweating—if it is not loose and porous it will not allow as much evaporation. Plastic and rubberized clothing are particularly bad in this respect. Evaporation requires dry air to be most efficient and if the relative humidity of the surrounding air is high, evaporation of sweat (and consequent heat loss) is considerably reduced. Flow of air around the body also encourages evaporation.

Although sweating is a good way to lose heat, a price does have to paid—water and salt are lost from the body. If the body does not replace water at the rate at which it is lost, dehydration occurs. Sweat contains salt and an overall loss of body salt can cause muscle cramps and eventually affect the heart and the brain. If heat stress continues untreated, eventually the sweating mechanism fails and body core temperature rises relentlessly. This is called heat stroke.

Maclgfee: That sounds frightening, Doc. What should I do if I feel so hot that I may get ill while I'm flying?

Doc: Well, a lot depends on the circumstances—whether you are on a routine mission or at war, flying a fixed-wing aircraft or helicopter, and, of course, the altitude and stage of flight. If possible you should increase the ventilation of the cockpit, directing any cool air that is available to the head and neck, which are the most efficient areas for dissipating heat from the body. If you have water on board, drink it, and if supplies allow, splash it over your face, neck and clothing. If all else fails and you are really worried, land.

Maclgfee: What can we crewmembers do to prevent heat stress problems?

Doc: Being aware of the dangers of heat stress incapacitation is half the battle. Of prime importance is the necessity for adequate hydration. Most people tend to remain slightly dehydrated during the day and make up for it at night. Coffee and alcoholic drinks tend to dehydrate us and should be avoided before and during flight (for alcohol that goes without saying!). You should drink lots of water all day when it's hot and carry plenty of cool water with you when you fly and drink at least one pint per hour. As a check on your state of hydration, weigh yourself before and after flight on a very hot day using the same accurate scales: weight loss signifies dehydration. Salt replacement is of secondary importance to water. During a hot spell of weather you might add a little extra salt to your food, but do not take salt tablets—they can cause trouble.

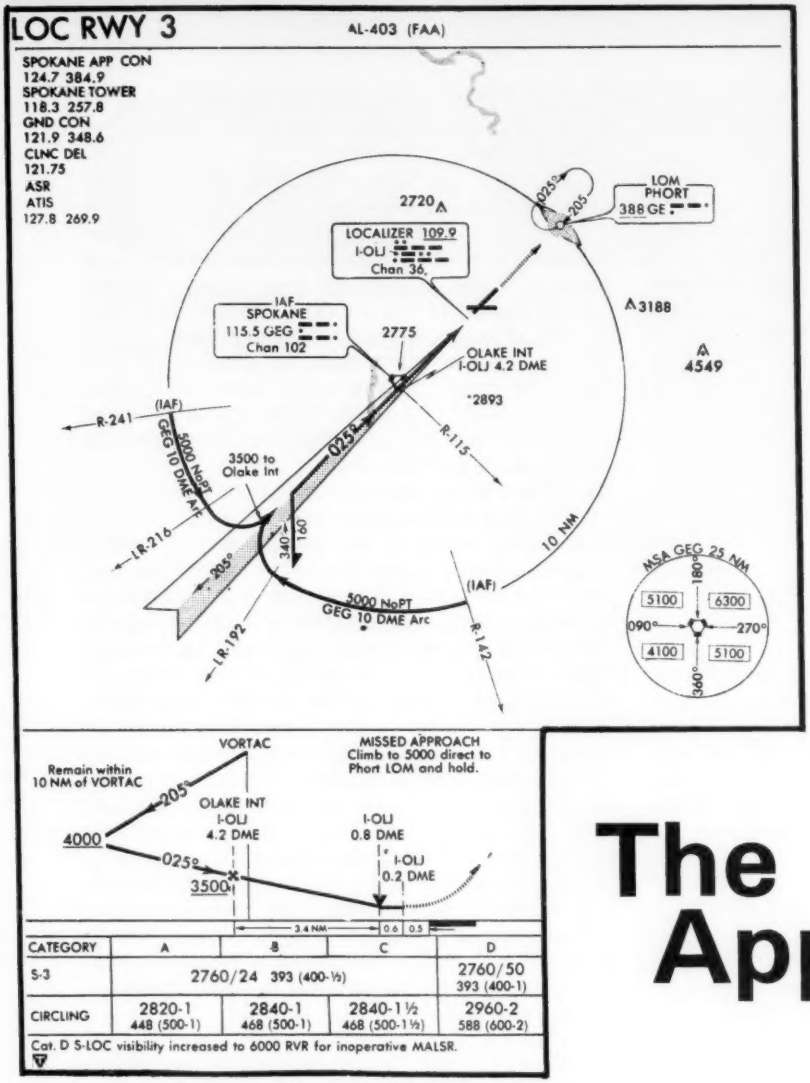
If you are stationed where it is hot alot, get yourself involved in a progressive exercise program, under the supervision of an expert, insuring that you remain well hydrated at all times, and you should be heat-acclimatized within 10 days.

Keep as cool as you can before climbing into your aerospace airlifter. Stay out of direct sunlight as much as possible and keep your flightsuit zippers undone as much as you can, consistent with modesty and fire protection.

Finally, I'd like to make a plea that the working environment of everybody connected with aircraft, and especially aircrews, should preferably be air conditioned. Remember, a cool crewmember is a safer crewmember.

Maclgfee: Thanks for the info, Doc. Keeping out of trouble when the heat is on shouldn't be any sweat at all.

—Adapted from *Flight Clues*



Sample approach using collocated ILS and DME.

The Approach

by Captain Gerard D. Hicks

At some point in our flying careers, a few of us make a distinction between a safe aircraft and a safe flying environment, with less emphasis on the latter. If we find one minor discrepancy on our aircraft, most of us don't think twice about writing up the problem. But when a discrepancy is found outside the aircraft, in our flying environment, the write-up becomes a write-off to experience: the other guy's fault, the controller, just one of those days, etc. Possibly, this distinction began in flight training where it seemed the aircraft was made the center of attention.

Of course the logic behind a write-up is simple; you want someone to know about a discrepancy so it can be fixed. And prior to having it fixed, it also seems a good idea to let the next crew in on your discovery so they won't be surprised by it, particularly during a critical phase of flight. Unfortunately, our enthusiasm for alerting others to a hazardous condition doesn't always extend to the problems found *outside* the aircraft.

For a moment, try to visualize the hazard reporting program in your unit. You'll probably find it being about as well received as the annual fund drive. Sure, the colorful posters are up on the walls. There's probably a stack of blank forms available, and occasionally, a pitch may be given for the program. But how many people are actually contributing?

For some of us, a good dose of posters and briefings may do the trick. However, for those of us holding out for something more, it sometimes takes a shock treatment, like the one I received, to set things straight.

The incident to which I'm refering actually started several months prior to its final climax. Two unit pilots, Capt Daniels and Capt Thomas, were out on a local instrument training flight. It was a warm autumn afternoon, and two hours of bouncing in the helicopter was beginning to take its toll. The instructor, Capt. Daniels, decided to depart from the planned routine. He directed Capt Thomas to try a different instrument approach to the local civil airport. Neither pilot had ever flown the approach, but the weather was VMC, and the snail's pace of the chopper gave them time to glance at the approach plate.

Thomas completed the instrument approach briefing with no apparent discrepancies as far as the instructor could

see. On final approach course, Thomas called "Final Approach Fix" and began his descent to MDA at the prescribed DME reading. The first sign of something going wrong came when the controller questioned the crew about their early reporting of "Final Approach Fix Inbound." Not really recognizing a problem, the crew brushed off the call with some half-hearted reply and pressed on. The second time the controller questioned their FAF call, the pilots became slightly annoyed at this apparent challenge to their flying skills. Yet while trying to figure out what the controller was getting at, they continued inbound. It wasn't until they spotted a hill rising between them and their destination that they figured something had gone wrong, but what?

Capt Thomas stopped his descent to clear the hill while Capt Daniels watched as they passed over it a short distance from the vortac they were using for DME guidance on the approach. With all the cockpit instruments and outside visual references indicating a perfect approach, it just didn't make any sense that they would have impacted a hill had they continued their descent.

It wasn't until an hour after they landed at home base that Capt Daniels discovered their mistake. During their last minute change of plans, no doubt aided at that point by their less than alert minds, they missed a deceiving quirk in the approach procedure. The vortac they used for DME guidance was actually slightly left of the final approach course; it should only have been used for initial approach fix guidance. The DME transmitter for the approach itself was located at the runway threshold, several miles from the vortac!

In discussing the approach with the other pilots in the unit, the IP found them to be just as confused by the layout of the procedure as he was. At that point, at least the unit pilots knew of the hazard, but what of all the other pilots not in the unit that could have made the same mistake? Well, this didn't appear to be too much of a problem since Daniels felt proper planning on his part would have caught the mistake. It was just one of those days, and that was the end of it.

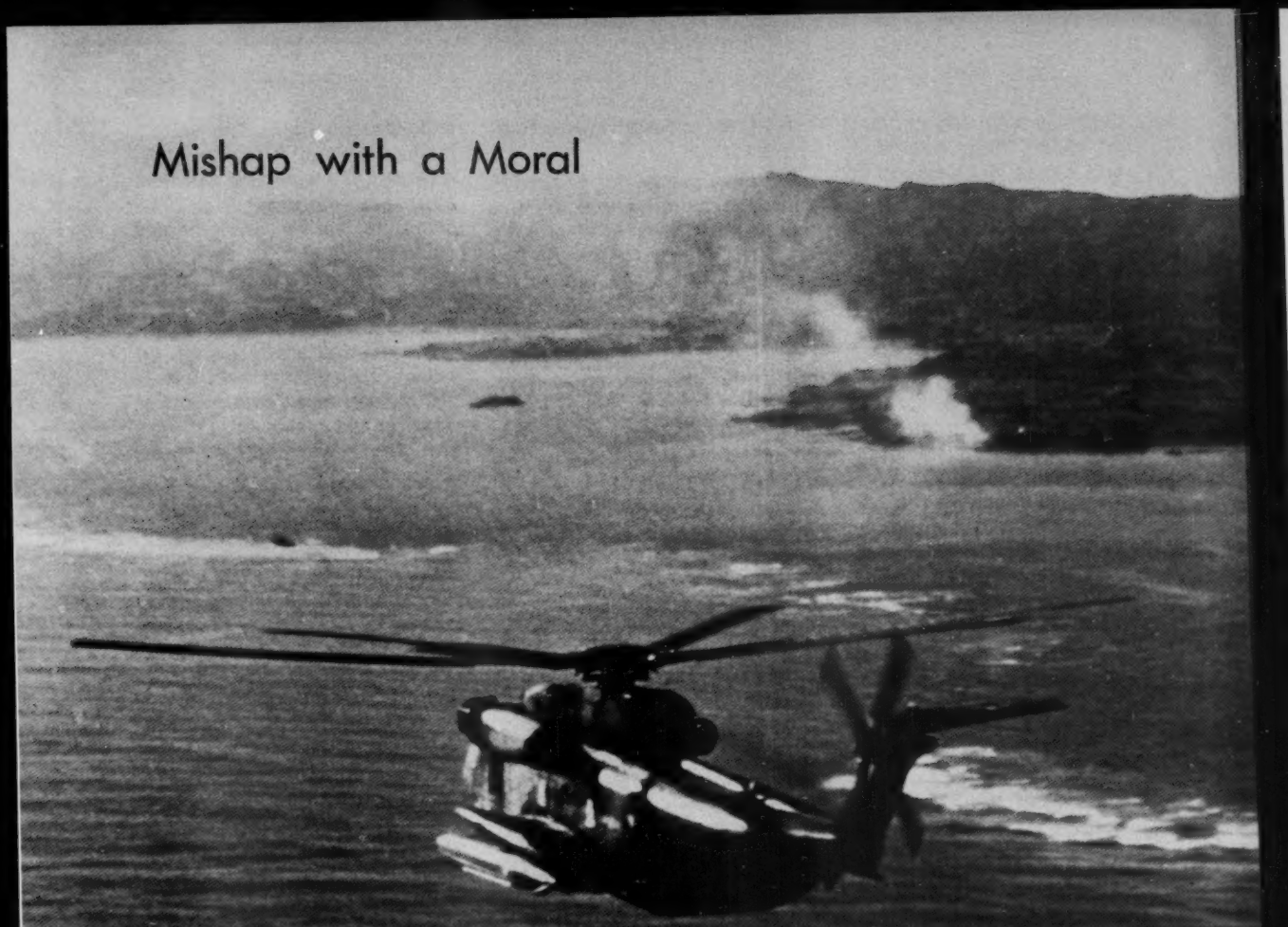
Several months later, Capt Daniels and Capt Thomas were pulling an alert tour for local rescue missions when a call came in. A commuter airliner had disappeared off radar while on an instrument approach to the nearby civil airport. The pilots and their crew launched on the mission with an uneasy feeling inside themselves. But it wasn't until they made their initial pass over the airliner's wreckage that the message came through loud and clear, confirming their worst fears. From the indications of the debris pattern, the initial impact point was almost exactly the same spot Daniels and Thomas would have hit had they continued their approach several months before. This time, however, the weather was worse than what they had encountered on that warm autumn afternoon. As they finished their pass over the site their eyes met: there was no need for words between the two pilots.

Several weeks later, a series of news releases brought out some interesting points about the accident. To summarize them, it seems the aircraft was flying a localizer approach with a collocated DME. The vortac, located several miles from the runway, was very near the final approach center line. The commuter airline crew probably failed to tune the correct frequency for the collocated DME and descended too early into high terrain. Subsequent investigations also turned up several other pilots who admitted making the same mistake. Unfortunately, this hazard was brought to everyone's attention one accident too late.

Sometimes, judging by the stacks of blank, untouched hazard reporting forms, you'd believe we flew in the safest sky possible. But just think back to the number of hazardous situations you've probably witnessed. Next time you're furiously writing up your aircraft, ask yourself if you'd be as diligent if you discovered a discrepancy outside the cockpit. Admittedly, formally disclosing a hazard requires more effort than a single 781 write-up. And not every situation you fail to report will end as disastrously as that of the ill-fated commuter. But believe me, this accident did happen. And for the small effort it takes to file an HR, who among us would be willing to chance somethig similar happening again?

Captain Hicks was a member of Det 24, 40 ARRS, Fairchild AFB, Washington, when his life was tragically ended in a boating accident during May 1981. Ironically, his Honorable Mention winning story from the 1980 Flying Safety Writing Contest was published in the May issue of the Flyer, *and this article was under consideration by the judges of the 1981 contest.*
We honor the memory of this fine young officer and author by publishing his story.—Ed.

Mishap with a Moral



Dead Stick

It takes skill to culminate a good deal.

It looked like a good mission for an IP, and it would certainly be a break from the normal flying routine. A local orientation and transition training mission with a pilot inexperienced in helicopters might even be exciting—well, at least interesting. As the squadron scheduler, the young captain was in a perfect position to take advantage of the opportunity, so he put himself down as the IP and scheduled another pilot and a flight engineer to round out the H-53 crew.

Rejecting the primary aircraft slated for the mission during their preflight, the crew pressed on to the back-up helicopter and readied

it for departure. Preflight checks and engine start went smoothly and the crew was soon waiting for their trainee with both engines running. Without warning, the crew felt a jump in the rotor tip path and the master caution, number-one-generator, and number-one transformer-rectifier lights illuminated momentarily. The flight engineer checked the circuit breakers and electrical systems but found nothing wrong. After discussing the indications with maintenance, the crew dismissed the incident as "transitory" and decided to continue the mission.

Moments later the guest pilot arrived and immediately got into the right seat—the "pilot" position in a helicopter—moved it forward and indicated he was ready to go. The IP called ground control at the busy international airport, and then instructed the pilot on taxi techniques as the big helicopter moved to the takeoff position.

The IP flew the takeoff and departure, then gave control of the helicopter to the right-seater once they were outside the airport traffic area. They flew VFR to a nearby civil field where they planned to do transition work.

Approaching the airport, the IP called the tower and was informed winds were 050 degrees at 15 knots with gusts to 27 knots. The helicopter was cleared for an approach to runway 05 and for "the option." The left-seater flew the approach and landing while instructing the pilot on various procedures and techniques. He then made the takeoff, entered right traffic for another pattern, and transferred control to the right-seater.

The tower again cleared the helicopter for the option approach, but requested they spend minimum time on the runway because there was another flight inbound. Since the pilot wanted to do some hover practice over the runway, the IP requested a 360-degree turn for spacing. Tower approved, and the left-seater took the helicopter, made the turn, set the H-53 up for final approach and transferred control back to the pilot. During this approach the right-seater overcontrolled the helicopter. Even though he made a successful landing and practiced hovering for about five minutes, he had considerable trouble with the cyclic trim system and was hesitant to use the cyclic trim switch.

During the next trip around the pattern the IP turned off the overhead cyclic and collective trim switches, completely disabling the trim system. This technique made flying the aircraft easier for the inexperienced pilot, and the spare pilot and engineer both mentioned later that subsequent approaches, landings and hover work were much smoother. After six minutes of practice hovering, the pilot again flew a right-hand traffic pattern and made a landing. The H-53 was on the ground for about 15 seconds when the right-seater leaned forward slightly and moved the cyclic stick forward to position the rotor tip plane to compensate for the 20-knot headwind. He then turned to look at the IP and engineer and inadvertently moved the cyclic to the left slightly. When he turned back, he moved the stick further forward and then aft.

The pilot's inputs caused the rotor tip path to dip forward and to the left within two feet of the ground. The IP, however, didn't notice this dangerous situation, because his attention was momentarily diverted to the master caution light which had blinked about the time the pilot moved the cyclic farthest forward. But a split second later the instructor felt the rotor blades strike the fuselage and by the time he looked up, the rotor path had already returned to near neutral. The blades hit the left top of the helo's fuselage and the refueling boom. The IP assumed control of the aircraft, notified the tower of the blade strike, and directed engine shutdown and evacuation. There was no fire and everybody egressed safely.

Analysis

At first glance, this mishap appears to be a case of sloppy pilot technique, but there were several other factors involved. Both human factors and supervision played a part in setting up the crew.

The visiting pilot had over 4,000 hours of flying time, but most of it was in fixed-wing aircraft. He had flown the H-53 a few times before and had accumulated 3.6 hours on two flights in the last 30 days. His mentor was a young captain instructor pilot with just over 1,200 hours of flying time, all of it in rotary-wing aircraft. He had been an H-53 IP for less than four months and all of his previous flights as an IP had been with squadron pilots. Pressures to complete the mission and please the guest pilot were there, even if not openly expressed.

The pilot's difficulty with the cyclic trim system probably stemmed from the fact that it does not operate exactly like the standard fixed-wing trim system, especially in a hover. When properly used, the H-53 setup allows the pilot to move the cyclic to a certin position, release the trim switch, and relax pressure on the stick. The

trim release switch momentarily disengages the spring tension and when released, holds the stick in the new position. If the trim release button is not pressed, any stick movement is against the spring tension and when the pressure is relaxed, the stick will return to its original position. This pressure can be trimmed out by using the standard trim button on top of the cyclic (just like in fixed-wing aircraft), but in a hover it is not fast enough to compensate for the constant small precise movements in all directions that may be required to keep the aircraft stable over one spot. When the cyclic trim system is disabled, the stick offers no resistance to movement and is often referred to as a "dead stick." With no spring force to hold it in place, the stick will actually "fall" if not held constantly in position. In this condition, the pilot must be aware that any unnecessary movement of the right hand holding the cyclic will result in immediate movement of the rotor blades.

There are several similar switches on the H-53 cyclic stick grip and on a previous flight the right-seater had inadvertently turned off the automatic flight control system instead of pushing the trim release button. His reluctance to use the trim system caused him to fight the controls and handle the H-53 roughly enough to make the first-stage servo-out caution lights illuminate twice during his first approach. Subsequently the IP turned off the trim system.

With the controls more sensitive to the pilot's inputs, another human factor entered the picture. When the pilot got into the cockpit, he only moved the right seat forward and did not adjust its height. In this position he was flying the H-53 with his right arm over an inch above his right leg. Normal technique is to move the seat height so the right arm will rest on the pilot's right leg when in the normal flying posture. The position of the inexperienced pilot's arm made it easier for him to make inadvertent control inputs.

Several supervisory factors also played a part in the mishap. Although the IP was qualified, he didn't have adequate training to instruct non-helicopter pilots. He and unit managers didn't look into the pilot's qualification level and they allowed the mission to launch without any face-to-face briefings for the pilot on mission profile, flight controls, control techniques, or critical phases of flight. Also very little actual flight maneuver planning was done, and the mission took off with a general intent to "go shoot some transition." The guest pilot was not even briefed on emergency and egress procedures before departure.

Investigation of the pilot's qualification showed that he was not qualified in the H-53, and had never been a helicopter pilot. He was, however, properly authorized to fly at the controls of the unit's aircraft because of his position, and he had previously logged three sorties in the H-53.

The final move that set the crew up for the mishap was the IP's decision to turn off the trim system to help the pilot handle the helicopter more easily. Judging from the pilot's reluctance to use the system properly, it is no surprise that turning it off allowed him to fly the aircraft smoother, but apparently neither pilot fully appreciated the results of disabling the trim system. The complete lack of artificial feel in the stick gave the flyer no feedback from his control inputs, and inadvertent positioning of the stick became very easy. With the rotor disk tilled forward to compensate for the headwind, only a small additional input was necessary to cause a blade strike.

Unfortunately, this accidental input came at a time when the instructor's attention was diverted by a warning light. Thus, the young IP didn't know the controls had been positioned dangerously or see the rotor tip path dip until the damage was already done.

Prevention

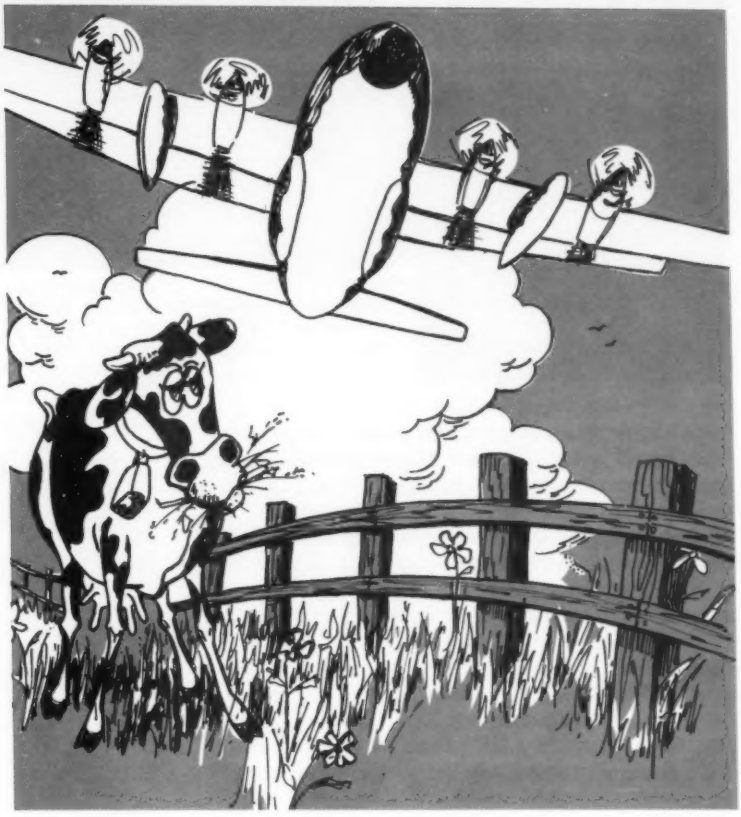
Complying with a basic rule of flight might have prevented the mishap—"Never turn off a good system during normal operations." Most aircraft are carefully engineered to fly easily (and safely) with all systems in normal operation. If they don't, it's more likely to be a human problem than a systems malfunction.

Equally important is careful selection of crewmembers to accomplish a specific mission—another basic principle of good aviation operations. If the IP had been more experienced, or properly qualified for teaching non-helicopter pilots, then he might have used better techniques and judgment while instructing the inexperienced pilot. Also, if unit managers had determined that the visitor was basically unqualified to operate the H-53, they might have searched for a more highly qualified instructor to fly with him, and insured that he was properly briefed before the mission.

In this case, however, faulty judgment and poor management teamed up with inexperience to produce a mishap that cost the Air Force over $270,000.

COWTITUDE: An udderly amazing technique

by Captain Raymond E. McHale
62 TAS, Little Rock AFB, Arkansas



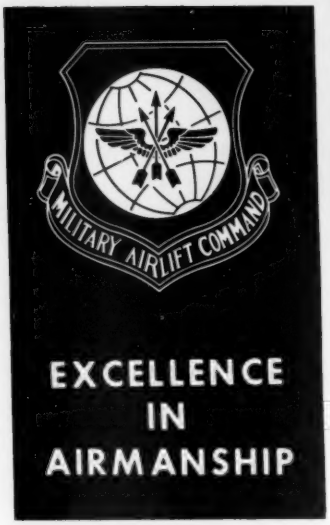
Having been a tac (for tactical, not TAC) trained killer for nigh on 10 years now, and having had my share of aggressive 2DLTCPs (Second Lieutenant Copilots, or 2nd time around Lt Colonel Pilots), I have spent considerable time at altitudes nearing the bottom of the mandatory 300 feet AGL that the "good book" (MACR 55-130) specifies for combat training. The designers of the omnipotent thunder turkey, dubbed C-130 for technical purposes, strategically placed the only means of absolute altitude determination in the most secluded location they possibly could. Oh, I guess they could have put it where the standby compass is, but they probably wouldn't have been able to tie its operation into the touchdown relay as inconspicuously. Whatever their real intent, they have forced me to devise my own method of judging altitude above the tree-tops. I have dubbed this method of airmanship "Cowtitude."

Cowtitude is completely nontechnical and nonscientific. Even so, it is a highly useful, significant method of altitude determination. In addition, to keep the EW folks happy, it does not rely on the emission of any radar energy whatsoever! Basically, my theory is a corollary of the off-or-on course method of navigation used by many Herky haulers over the years. That being, if you fly over a heard of cows and they break into a dead run and scatter to the four winds, you're off course. If, on the other hand, they merely look up in disgust and don't run, you are on centerline, or near enough to be sure that someone else has been there before! Of course this method is not accurate in unfamiliar territory where, hopefully, all cattle will run!

Anyway, I have discovered that at 1,000 feet above the ground a cow can be distinguished from a horse, or a beat up old car, or something else of similar size and shape. It can be recognized as a cow! When you go on down to 500 feet you can put legs on them. Unless, of course, they are lying down. Further on down to 300 feet you can discern the tail. And if you can make out the udders—you're too low!

I have also determined that in the desert, at 500 feet AGL you can put the hump(s) on a camel (or dromedary), and under austere Artic conditions caribou and moose may be substituted for cows since the local tundra usually precludes cattle grazing. The antlers may be substituted for the tail determination, remembering the larger antlers are on the bull.

And speaking of bull, I think I'll close this bovine extraction theory without the usual recap. Suffice to say that happiness is a contented cow—think about it.



Back row, l to r: SSgt Richard L. Duwe, FE; SSgt Joseph W. Drummond, FE; Capt Donald C. Trowbridge, FEAC. Front row, l to r: Capt Robert L. McDaniel, AC; Sgt Peter M. Jaskot, LM; TSgt Roy A. Parmley, FE. Not shown: Lt Col Karl A.D. Gross, MSgt Leonard J. Gill, SSgt David E. Foley, SMSgt George E. Dragoo.

Captain McDaniel and crew. When the Starlifter's gear handle was lowered during prelanding maneuvers, the crew heard a loud bang which was followed immediately by an abrupt yaw and shudder throughout the aircraft. The gear indicator showed that both mains were down and locked, but the right bogie also indicated unsafe (not level). Just to keep things interesting, the number two hydraulic system conked out right on the heels of the landing gear dilemma. Capt Robert McDaniel, aircraft commander, sent a crewmember back to inspect the gear while he positioned the flight control switches to compensate for the partial loss of primary hydraulic power. The approach was discontinued and the Starlifter slipped into a holding pattern so the crew could sort out their systems problems. TSgt Roy Parmley, the scanner, was unable to see exactly how the errant gear was situated because the viewing window was smeared with hydraulic fluid, however, he was able to make out that it was down in an abnormal position. After coordinating with appropriate ground agencies, the crew decided Offutt AFB was the best location to try and set the crippled bird down, considering weather and other factors. Enroute there, Sergeant Parmley attempted to trace and cap off the hydraulic lines leading to the sick gear so that normal hydraulic system operations could be resumed, but his efforts proved futile when the fluid reservoir continued to deplete when the pumps were reactivated. The crew secured all loose items in anticipation of a crash landing and the AC traded positions with Captain Donald Trowbridge, a flight examiner pilot who was on board and was better qualified to attempt an emergency landing. A low-altitude flyby at Offutt revealed that the right bogie was dangling at an extreme angle—nearly perpendicular to the fuselage. If it folded backward on touchdown, it was expected to shear off and leave the C-141 wide open for a catastrophic smashup. But a belly landing was out of the question as an alternative, because loss of hydraulic power precluded even attempting to retract the gear. Captains McDaniel and Trowbridge cooperated closely on the approach and landing, keeping the left wing low by cross rudder and aileron techniques. Insuring that touchdown was on the left mains only, they made certain that the plane didn't settle onto the right main gear until the last possible moment on rollout. Fortunately, the gear folded forward when the right wing finally was lowered, and the pilots stopped the Starlifter safely on the runway using emergency brakes and spoilers. The calm and professional Excellence in Airmanship of the pilots and crew during this serious emergency helped insure safe recovery of a valuable aircraft.

Capt. Christopher K. Clark. Just as the wing flaps were raised during a simulated engine-out low approach, the Hercules rolled sharply to the left. Captain Clark, instructor pilot, immediately recognized the flap system failure, and repositioned the flap lever to stop flap movement. Then he assumed control of the

aircraft from his initial-qualification student in the left seat. Clark determined that wings-level flight was possible only with 80 percent right aileron deflection. A scan of the wing revealed that the right outboard flap was fully extended, while remaining sections had retracted to about 30 percent. A controllability check was run at 10,000 feet, and Clark found that with gear extended, a normal left turn could be made, but only 10 degrees of right bank was available. Also, differential power was only marginally effective in maintaining aircraft control at approach airspeeds. Despite these handicaps, the instructor pilot decided that a landing attempt could be made safely. During the approach and landing, nearly full aileron input was needed to compensate for the assymetrical flap condition. After touchdown, directional control was maintained by the IP's skillful use of the rudder, brakes and differential power. Captain Clark's Excellence in Airmanship was instrumental in saving the aircrew and preserving a valuable aircraft.

Capt Christopher K. Clark, IP

Major Mason and crew from the 773 TAS, Dyess AFB, Texas, were enroute from Key West to Shearwater, NS, when their C-130H began acting up. Cruising along in VMC above a cloud deck, their first indication of trouble was the illumination of the number two generator-out light. Soon after starting the emergency checklist, they smelled electrical smoke, and the flight engineer, SSgt Patrick Powell, discovered a burned out generator control panel under the flight deck. Emergency descent into Pope AFB, N.C., was begun, but during the checklist procedures the APU failed to start, and nonessential electrical components were quickly shut down. The Herk entered clouds at 6,500

Back row l to r: Maj David J Mason, AC. 1Lt Mark A. Anderson, CP; Lt Col Richard C. Parker, N; Front row, l to r: SSgt Patrick P. Powell, FE. TSgt Charles E. Bucher, LM; A1C Kenneth W. Wallen, crew chief.

feet, then had to level off at 5,000 because of a four-ship formation below it. As soon as they were solidly in the soup, the cockpit lights went out, engulfing the crew in darkness. Using crew flashlights to see, Major Mason continued flying by reference to the altimeter, standby compass, ball and airspeed indicator. Sergeant Powell selected standby power, but it didn't work because it was also being affected by whatever had caused the other problems. In the eerie glow of flashlights, each crewmember went about doing his best to keep the disabled airplane right side up and airborne.While the pilot handled the controls, the copilot, 1st Lt Mark Anderson, made radio calls setting up an immediate descent and vectors to Pope. Lt Col Richard Parker, navigator, kept close track of the plane's position and monitored ATC instructions and vectors to insure terrain avoidance. A1C Kenneth Wallen, crew chief, readied the fire extinguishers, while TSgt Charles Bucher, loadmaster, assisted Sergeant Powell in opening a panel cover so they could reset circuit breakers. They temporarily restored lights and instruments, but the breakers kept popping. Sergeant Powell repeatedly held them closed until they would become too hot to touch and thus provided intermittent instrument power throughout the descent and approach. When the windshield fogged over on final, the engineer kept wiping the inside of the glass so Major Mason was able to see and make a safe landing. The teamwork of each man during this serious inflight emergency exemplifies what being a MAC crewmember is all about and truly reflects Excellence in Airmanship.

BOOK REVIEWS

by Major James G. Gibson II

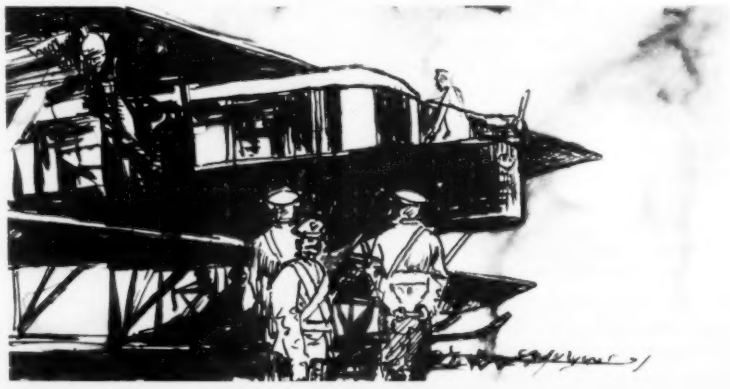
Fascinating reading for aviation buffs.

Several people have called seeking information on where they could obtain certain books they read about in previous TMF *book review columns. Contrary to most features of this type in other publications, which deal exclusively with newly published titles, many* Flyer *reviews are about books which have been around awhile. They still contain worthwhile information, and many are on the shelves of the base library in the aeronautical section (try the 620s for openers.) Newer offerings should be available for purchase at local bookstores if you want to add them to your personal library. To make it easier for you to differentiate, we will include the latest copyright date along with the title and author information from now on.* —Ed.

Flight With Power
by David Wragg
(Published in America in 1979)

An astounding number of developments in aviation took place between the Wright Brothers' first powered flight in 1903 and the onset of World War I. Mr. Wragg has put that decade under the microscope and chronicled the people and events that were instrumental in those developments, and he has illustrated his narrative with a fascinating and extensive array of old photographs. Although much of the ground covered in this book will be somewhat familiar territory to avid aviation buffs, Wragg manages to unearth quite a few interesting tidbits that you may not have run across in other volumes on flying history. For example, were you aware that the payload on the first air cargo flight, which was made by a Valkyrie monoplane on July 4, 1911, between Shoreham and Hove in Sussex, England, was a consignment of lightbulbs for the British General Electric Company? Here's another one: the first four-engine airplane was designed and built by Russian aeronautical engineer, Igor Sikorski, and first flew in 1915. Called "Bolshoi," the behemoth biplane featured a closed cockpit for the pilot and copilot, and the cabin was plushed out with such amenities as armchairs, a sofa and a table. Its numerous innovations put the huge airplane about 21 years ahead of its contemporaries. The next year, Sikorski, who later immigrated to the U.S. and became famous as a helicopter builder, amplified his Bolshoi design into an even bigger quadramotor, the Ilya Mouramets, which in its airliner configuration could carry 16 passengers, and made numerous long distance flights across Russia.

The only shortcoming of this book, as far as I am concerned, is that in trying to cover a tremendous number of events in a relatively limited number of pages of text (153 not including the chronology, index, etc.), Wragg glosses over a lot of territory I would have enjoyed exploring in more detail. Since *Flight With Power* was written by an Englishman, it tends to have a more "continental" slant than most aviation books written in the U.S., but overall I would have to rate it as a very objective and interesting glimpse at the first—and very pivotal—decade in powered flight.



Grand Old Lady
by LtCols C. V. Glines and Wendell F. Moseley
(Copyright 1959)

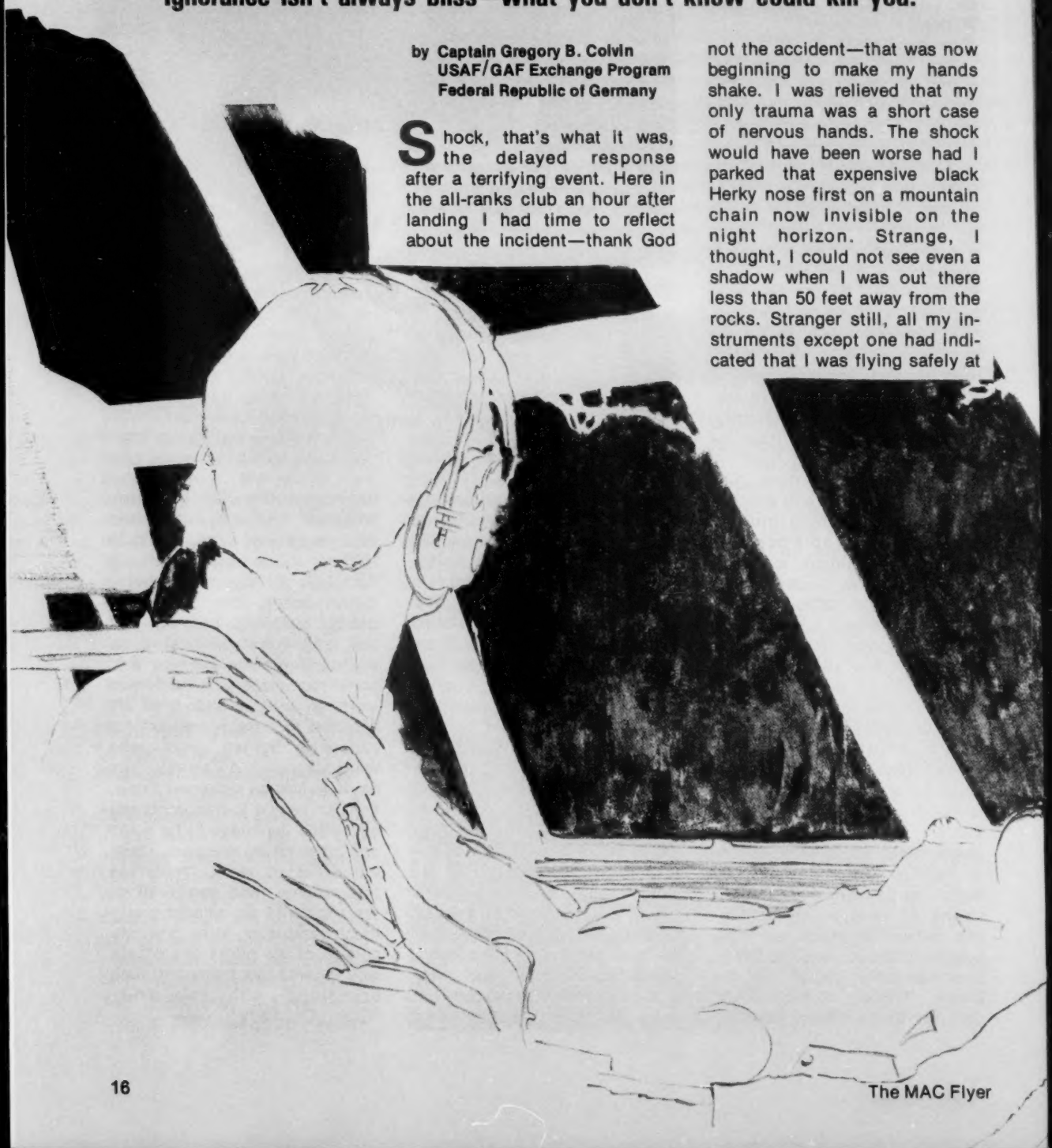
She was the airplane that made it possible for the airlines to really become serious, profit-making contenders in the mass transit/cargo carrying business during the 1930s, and she was a weapon of war and an angel of mercy for thousands of troops during a world war and several lesser conflicts. Eventually she became just about the most beloved and widely known flying machine ever to fly the world's airways. In both commercial and military service, she endured every sort of mechanical insult and indignity, but always seemed to have the spirit and grit to get fixed up and come back for more. She has been modified and adapted for use as everything from an engineless glider to a pontoon-equipped amphibian, and even proved adept at quickly laying communication cables over inaccessible terrain. Lord Mountbatten had one fitted out with radio gear and living facilities during WW II, and it was the first airborne command post. Another suffered the ignominious but utilitarian fate of being converted into a flying laundromat for the benefit of isolated troops in the South Pacific. After more than 45 years, many are still in service in various places around the world, and they're *still* going strong. In case you're wondering which airplane all this hoopla is about, it is the DC-3, also variously known as the Dizzy Three, C-47, R4D, Gooney Bird, Dakota, or any one of a dozen or more colorful nicknames and aliases. Glines and Moseley distilled a number of war stories from the extensive annals of Gooney Bird lore and combined them in this —by no means all-inclusive, but nevertheless thoroughly intriquing—aircraft biography. One of my favorite episodes for showing just how plucky the C-47 could be was the story of "Whistling Willie." In the spring of 1942, during the frantic evacuation of Hong Kong, a C-47 was caught on the ground at a small airstrip and thoroughly peppered by repeted Japanese starfing attacks. When things quieted down, the old girl had some 3,000 bullet holes in her skin. The punctures were temporarily patched with canvas and glue, and the plane departed for more permanent repairs at a base in India. On the way, however, it entered a rainstorm and most of the patches soaked loose and came off. Although it now resembled a flying sieve, the C-47 kept going, but wind blowing over the bullet holes created all sorts of weird howling and shrieking noises. The eerie wails were so intense that they are reported to have scared off six Japanese fighter pilots who were about to attack the hapless bird as it limped along, and for awhile it was considered by the Japanese to be some sort of a secret weapon. There are a lot of airlift "roots" in this volume, and nearly all of the incidents are related pretty much verbatim from the accounts of the pilots and others who shared so many intimate occasions with this truly "Grand Old Lady."

The Midnight Special

Ignorance isn't always bliss—what you don't know could kill you.

by Captain Gregory B. Colvin
USAF/GAF Exchange Program
Federal Republic of Germany

Shock, that's what it was, the delayed response after a terrifying event. Here in the all-ranks club an hour after landing I had time to reflect about the incident—thank God not the accident—that was now beginning to make my hands shake. I was relieved that my only trauma was a short case of nervous hands. The shock would have been worse had I parked that expensive black Herky nose first on a mountain chain now invisible on the night horizon. Strange, I thought, I could not see even a shadow when I was out there less than 50 feet away from the rocks. Stranger still, all my instruments except one had indicated that I was flying safely at



Second Place, 1981 MAC Flying Safety Writing Contest

planned flight altitude. A "little" Form 781 entry almost bit me in the rear end when I nearly flew into a cliff following unreliable instruments. Because a system monitor had not alerted me to a major malfunction till too late, I nearly killed my crew and myself while concentrating on a tiny jungle drop zone and multiple electronic threats. I had to wonder how it could happen to me, an instructor pilot with 2,000 hours in the MC-130. The club band was playing "Proud Mary" as the crew sat down for some post-mission fellowship and war stories. I drifted off into my scotch glass and began a mental review of the evening.

The command post controller had called me at 1830 to report that the aircraft was ready. I confirmed the fuel load, ordered a crew bus for eight o'clock, and walked out into the jungle heat to join the crew for dinner.

An afternoon thunderstorm had reduced the temperature a few degrees, but the road still steamed with humidity all around me. I glanced up at the clouds, wondering how low the ceiling was. I actually regarded foul weather as a friend because it helped prevent the bad guys from seeing us during infiltration. We ate dinner in the club with high spirits, joking about the lack of wine to go along with the steaks our friends from MAC had flown in earlier that day. We knew we were psyching ourselves up for a tough mission which we had named "The Midnight Special." Then we caught the crew bus and split up in the restricted mission planning zone for an hour of work and review before the full briefing.

By the time the briefing began, we had all seen enough to know that this Midnight Special was going to be a rough one. The weather man started it off. Thunderstorms were abating, but we could expect rain showers with minimum ceilings and visibility all night. The intelligence briefing sounded fairly grim, too. In addition to the threats we already knew, there were several new ones which our electronic warfare officer (EWO) would go over more thoroughly. We would probably confirm the reported sightings by drawing fire on our mission which began "Operation Keystone," and we were expected to turn the tide of struggle in our favor. Our most isolated special forces A-team had jumped in a week earlier and needed supplies and new weapons for their mission. They had infiltrated through the jungle right into the middle of all the action and were ready to go to work, if we could find them. The navigators followed with a route briefing for another A-team infiltration before the resupply drop. The first drop was different: visual or electronic with a three-second green-light time. Some of the rules had been waived to kick off "Operation Keystone." I was about to ask why they had planned the run-in "backwards" over a mountain, when they introduced the EWO to explain the rationale.

The EWO's briefing woke up anyone who may have been drowsy. The only good news on the entire route was bad weather which reduced the fighter threat by preventing visual contact after we penetrated the unfriendly area. We would attempt to stay below the radar coverage for ground controlled intercept, anti-aircraft artillery and surface-to-air missiles. The two most dangerous moments would occur over each drop zone, because we had to slow down and pop up in areas of newly reported radar-guided SAMs and triple-A. Defensive tactics would be standard. After each drop we had to return immediately to terrain-following flight at 500 feet or below.

There were no questions, the EWO had already answered them all. We picked up our classified codes without much conversation before heading for our "black beauty" to start the Midnight Special. We had worked together as a crew long enough to know that we depended on each other to survive and that every man would do his job well. When we arrived at the aircraft, the engineer gave me the thumbs-up sign, but he took me aside with the AFTO Form 781. The radome had been opened, closed, and signed off as clear, but nothing said why. I talked to the crew and line chiefs, but it was after the shift change and no one knew anything specific. I was painfully aware that mountain, night, low-level flying was nearly suicidal if our terrain-following radar was not in perfect working order. I called the command post to see if they could locate the radar technicians while we finished our preflight checks, but the answer came back shortly that on a Saturday night it was unlikely the technicians could be located in the 30 minutes before our

takeoff. The crew checked everything possible and then double checked; it looked like everything was all right. I still had a bad feeling about the unclear write-up, but self-tests and second checks showed no problems. The Keystone bundles were rigged and the A-team was already suited up and waiting. I repeated the crew motto, "world-wide wild," on interphone and announced that we were ready to go.

So, off we went. The radio operator tapped out codes to "mother" and called the countdown to radio silence for the first threat zone. The engineer curtained off the cockpit behind him to keep us blacked out with only dim red or ultraviolet lights on the instruments. The Midnight Special was on the way. No one was bothered by the late hours because night low-level keeps *everyone* awake. The copilot said he thought he saw traffic through the rain. I called the navigators and EWO asking if they had indications on their "Star Wars" machines.

The answer came back, "Yeah. Something at two o'clock and something at twelve, but they both look and behave like airliners. What the hell are they doing out here?"

There was a civilian airport near our first drop zone, so I cautioned the copilot and engineer to keep a sharp eye out for regular as well as hostile traffic. I was too busy on instruments to try any midnight clearing. The navigators called out terrain warnings as we worked our way through checklists to prepare for the pop-up and team infiltration. I wondered what electronic eyes might be watching as I pulled back the throttles and climbed to drop altitude where the navigators could better see their radar target, and where we also became a better radar target. Then the chatter of business began.

–photo by 1Lt Al Tyler

"Planned altitude and heading look good, pilot."

"Team ready, doors open, two- minute checklist complete, load."

"Looks like something at twelve, pilot. Keep watching."

"Pilot, nav, come five degrees left and pick up inertial steering. Radar target looks good. Thirty-second warning; 200 yards right and closing."

"Pilot, EWO, SAM still searching and it looks like we have airborn radar dead ahead."

"Ten-second warning. Everybody ready. Green light."

"Break right!" The copilot grabbed the controls away from me just as the loadmaster had called the jumpers clear. I looked up just in time to see a Boeing 707 come out of the rain about 200 feet away and fill the windscreen.

"Good work, copilot!" That airliner must have been tooling

around out there at 1,000 feet getting vectors into the local airport." I told the radio operator to crank up the di-dah machine long enough to tell home station that the team was in and that we had a near-miss with a 707. Since we were blacked out, that Boeing probably never saw us, but if he did the other side definitely knew we were in the area even if their radars could not pinpoint us. I cursed to myself, Here we are trying to beat every system in the book and we have a near-miss with a damn airliner. Oh well, back to torpedo altitude and full speed ahead.

We bumped and turned through the rainy mountains heading for the miniature drop zone. Everyone was on their toes after the hectic events surrounding the first drop. The interphone was quiet except for the radio operator reporting that "mother" knew our status. We began the next series of checklists as we approached the second high-threat zone where I again took the controls. While the copilot had been flying, I crosschecked every cockpit radar instrument with the navigational and terrain-following computers. We were flying on the lower limits of the systems, but, nevertheless, within the limits. Whatever the maintenance troops had done in the radome seemed to be working so far.

As we approached the second drop zone I prepared the crew with a briefing. "When I see the peak go off my radar scope, I'll be crosschecking instruments and outside. If electronic identification does not come through, look for the light code, X-ray. First one to see the DZ call visual contact and clock position. If it's right, the navigator will call a visual drop; if it's left, the pilot will call the drop. Loadmasters, hang on tight, because we are not likely to see the DZ until the last second; that could mean a sharp turn at the end. We have to be right overhead to keep this stuff from sailing off into the jungle where our guys may never find it. Except for drop commands or emergencies, I don't want to hear anyone on the interphone but the EWO with attack advisories preparing us for a break. This one will be tough, so let's make it right."

Shortly afterwards the tactical chatter started again.

If we flew lower or climbed higher, we were dead.

"Two-minute checklist complete. Steering from the computer looks good, pilot. The DZ should be at 12 o'clock over the ridge that's on the scope now."

"Pilot, EWO, triple-A scan at 11 and 12 o'clock."

"Crew, navigator, thirty-second warning. There goes the ridge."

"SAMs searching at 10 to 11. Fifteen seconds, anyone see the DZ yet?"

"Left!" The engineer yelled. "There it is at 11:30."

"Pilot will call drop," I announced. "Hang on loads."

"Five-second warning. Ready, ready, green light."

The DZ was so small that the three-second time until red-light actually stretched it a bit too long. Because I had made a last second correction to bring the Herk over the jungle clearing, one loadmaster had lost his balance and couldn't recover quickly enough to release his bundle. I now had to swing the Herk into a right turn, hugging the mountain ridge to keep us clear of electronic threats. Over the drop zone, however, we had received enough radar interrogation to expect active threats on the next pass. It would have to be our last try. I told the radio operator to put on the spare harness and go help the loadmasters get all three bundles out on our next pass.

Then I saw it. Low! The low-altitude warning light on my radar altimeter was on—a heart stopper at night in the mountains. Although my terrain-following radar systems still looked good, the needle on my radar altimeter was below the warning setting and unwinding towards 100 feet. I had a sinking feeling that something was very wrong as I pushed in full power to climb and saw the radar altimeter nearing 50 feet. I hoped there were no big trees on top of the saddle I was rapidly approaching because there was no room for maneuvering between the peaks. The 781 glitch flashed through my mind and time seemed to stand still. The copilot was still looking outside for tracers, but his radar altimeter indicated the same as mine while the terrain-following radar showed a couple hundred feet higher. I continued to pull on the yoke, hoping we would make it as I watched the airspeed drop off. My heart started to beat again when the MC-130 flew through the saddle instead of into the ridge.

Finally the computer monitor flashed a fail warning. "That's a little late," I commented. The navigator reported that the antenna system had shown a momentary failure, but he said

the panel was clear again. "Your panel may be clear, but the indications up front are way out of line," I told him. We were low-level with a system we could not trust. At the same time we could not climb much because of the heavy electronic threats that were just above us. The EWO had already begun his litany of SAM and triple-A radars searching from several quadrants. Still, I had to add at least another hundred feet to our altitude if we were going to avoid killing ourselves. The navigators surged a little more energy into their work, performing the demanding map reading required to get us through our last pass. With the EWO doing every trick he knew to jam the enemy radar, we found the clearing again and got three bundles out in less than three seconds without being fired on. Then I turned right to find our escape path back through the same saddle. We got through it safely and headed down the valley toward home.

I could hardly believe it. A near-miss with an airliner and then a nearer miss with a mountain. I ordered the crew to check all systems and to record all indications. I was now a confirmed believer in crystal clear Form 781 entries. The left navigator put his hand over his heart to see if it was beating. He had also seen 45 feet AGL in the saddle and was beginning a detailed description in the 781. I told the crew to be prepared after landing for an intensive debriefing to discuss lessons learned on this Midnight Special.

After the intel and maintenance debriefs, I told the commander I wanted to discuss the mystery in our 781. I told the story of our preflight apprehensions and then the strange unindicated failure which resulted in a 45-foot pass at terra firma. He then understood why I looked a bit pale and told me he would conduct a personal investigation during the three free days before our next flight. Then the colonel slapped me on the shoulder for a successful mission and suggested a couple drinks in the club, which would stay open late after the host wing's dining out. A good idea as far as I was concerned.

In the shower back in the "Q", I barely thought about the flight. I simply enjoyed the water washing away the sweat and heat from my still alive body. It was not until I was walking to the club that I began to think about how little padding 45 feet provided between my airplane and disaster. I realized that I had been closer to that mountain than I now was to the building tops beside me. A chill went up my spine as I thought about what a close call with destiny I had.

In the club when I told the rest of the crew of our 45-foot pass everyone shuddered. By then the crew chief had a little more background. He told us the terrain-following antenna had been changed, but the calibration and mounting bolts had not been properly checked afterwards. No one knew why. During the mission, the slap sweep of the antenna had simply caused it to work itself loose and after that there was no calibration. When we really needed the antenna in that saddle, it was looking up instead of down. Had I not pulled up when I did, I would have logged one, and only one, granite penetration.

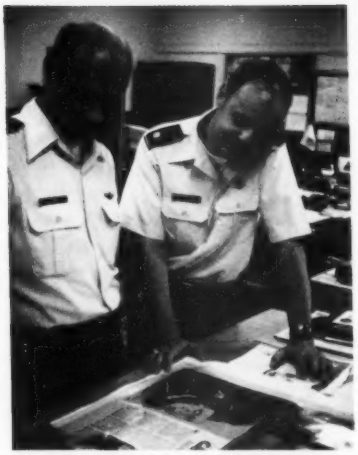
We all shook our heads and thanked the forces of the universe that fate had stayed on our side. The low pass resulted from a simple error which added to the adventure of flying, but the result of the mistake was nearly fatal at a time when we were worried about other things. The experience taught a good lesson: If you wait till later to clear up uncertainties about your airplane, you may not be around to find out the real answers.

ABOUT THE AUTHOR

Captain Colvin is a graduate of Franklin and Marshall College, Lancaster, Pennsylvania, and he received his commission through OTS in 1972. After pilot training at Columbus AFB, Mississippi, Capt Colvin was assigned to the 1st Special Operations Squadron, Kadena AB, Japan. He continued flying special-operations C-130s with subsequent assignments to the 7th Special Operations Squadron at Rhein-Main AB, FRG, and as a Combat Talon School IP in the 8th Special Operations Squadron at Hurlburt Field, Florida. He is currently on an exchange tour with the German Air Force flying the C-160 for the German 61st Air Transport Wing.

GLOBAL NOTES

Staff Changes at *TMF*



Major Jim Gibson (right) offers parting advice to Major Al York who moves up to Supervising Editor.

The World's Greatest Flying Safety Magazine has a new supervising editor. Major Alan D. York is taking the helm as Major James G. Gibson II returns to "the real world" of the 774 TAS at Dyess AFB, Texas, after being chief wordsmith with *TMF* since 1978.

Major York has been an Associate Editor and came to the staff with a broad background as a senior pilot experienced in a variety of aircraft, including both helicopters and fixed wing.

Major James P. Coe, the other Associate Editor, also bids *TMF* goodbye this summer after four years with the mag. He also returns to the Hercules cockpit, but will do his tactical airlifting with the 17 TAS at Elmendorf AFB, Alaska. A former C-130 pilot, Maj Coe came to the *Flyer* staff in 1977 from a MAC/ATC exchange tour where he instructed fledgling flyers in how to slip the surlies safely in T-37s.

Newly arrived members of the brotherhood of inkstained wretches are Captains Gale E. (Gene) Clouse Jr. and Byron L. (Buzz) Howard. Captain Clouse was a dual-qualified navigator stationed at the Lockheed-Georgia plant, where he participated in acceptance check flights for both C-130s and C-141s. Captain Howard, a C-130 pilot comes to *TMF* from Dyess AFB, Texas, where he gathered considerable experience in tactical airlift, and especially aidrop operations, as a SKE-lead AC.

Major Jim Coe: "The magazine is like a jealous mistress."

Capt Gene Clouse: "How many days a month do you guys really work?"

Captain Buzz Howard: "Please, call me anything but Byron."

436 MAW Wins SICOFAA Trophy

The Spanish acronym stands for the System of Cooperation Among Air Forces of the Americas and the trophy is awarded to the Air Force flying unit considered to have had the most meritorious achievement in flight safety during the calendar year. The SICOFAA Award was established by the Inter-American Air Forces Chiefs in 1976 to recognize aircraft accident prevention accomplishments of military organizations.

The 436th "Eagle Wing" won the trophy for the can-do safety spirit which has made it a leader in mishap prevention. The people of the Wing can be justifiably proud of garnering such a prestigious award.

MAC Individual Flying-Hour Milestone Awards

It takes a long time to accrue 2,500 hours of accident-free flying as a helicopter crewmember—in many instances even longer than it does for fixed-wingers to attain 5,000. Therefore, we present the following recent 2,500-hour awardees as the first installment of a periodic feature that will list all future Individual Flying-Hour Milestone Award winners. Congratulations!

Lt Col Joseph R. Kolek, Jr, Det 24, 40 ARRS
Maj Otis A. Brende, Det 24, 40 ARRS
Maj John F. Bridges, Det 2, 37 ARRS
Maj John P. Cato, Det 24, 40 ARRS
Maj Richard G. Gasparian, Det 9, 37 ARRS
Capt Michael C. Callahan, Det 7, 37 ARRS
Capt Oral W. Carper, 305 ARRS
Capt George M. Culverhouse, 18 MAS
Capt Edward L. Fleming, 102 ARRS
Capt Cowan E. Gentry, 33 ARRS
Capt Richard L. Greenlee, Det 5, 37 ARRS
Capt John M. Hiemstra, 1 HS
Capt Paul C. Mercready, 102 ARRS
Capt Richard A. Vandane, 1 HS
Capt James C. Woolworth, 305 ARRS

ARRS Flyers Win 1980 Cheney Award

Given annually for an act of valor, extreme fortitude or self-sacrifice in a humanitarian interest performed in connection with an aircraft, the 1980 award goes to Captain Ronald W. Summers and First Lieutenant Kim F.P. Skrinak of Det 1, 37th Aerospace Rescue and Recovery Squadron, Davis-Monthan AFB, Arizona. The two helicopter pilots, flying an HH-1H, rescued a severely injured glider pilot who had crashed in a remote and rugged mountainous area. Harsh terrain and the extent of the victim's injuries procluded ground evacuation, so the rescue pilots braved bad weather, high winds and fading daylight to maneuver their helicopter into position perilously close to a 300-foot-high cliff. On the third approach, and with fuel getting low, the injured pilot was safely retrieved and flown to a hospital.

USAF Safety Plaque Winners

The Chief of Staff, USAF, awards these annually for outstanding safety achievement and mishap prevention.

Flight Safety Plaques

39 ARRW
41 RWRW
54 WRS
89 MAW
165 TAG (ANG)
304 ARRS (AFRES)
314 TAW
317 TAW
375 AAW
435 TAW
436 MAW
463 TAW
908 TAG (AFRES)
920 WRG (AFRES)

Nuclear Surety Plaques

6 MAS
36 TAS

C.R. TERROR

Our Heavy Pilot tries some very light weight flying.

It's gotta be the ultimate flying experience, Sam m'lad," C.R. chortled to his long suffering cohort as they entered the casual bar for the Friday evening happy-hour ritual. Reaching into the zippered legpocket of his custom tailored flight suit, the Rotund One pulled out a sheaf of full-color brochures and handed them to his sidekick with a flourish. "They mounted a little two-stroke engine on a hang glider and voila!—an ultralight airplane," C.R. announced with a grandiose wave of his pudgy paw. "I happened to see a demonstration flight at the local shopping mall last weekend. Right then and there I decided that this was definitely my cup of tea."

Never one to procrastinate, unless it's to avoid brushing up on tedious tech order material from his Dash One, C.R. described to his attentive assistant how he examined and sat in the powered hang glider, and then watched the dealer put the miniplane through its paces above the mall's parking lot. "I tell you, Sam, it was love at first flight, and I put a deposit down on one of those beauties right on the spot," concluded the Aerospace Adventurer, clutching one of the photos to his breast.

"Neat looking machine, Boss," Sam observed with genuine interest. "But where would you fly one of 'em around here?"

"Ah, an astute observation m'boy," parried the Paunchus Pilot, taking a generous sip of his Terrorific 'tini. "That's precisely why they put an engine on it. Self contained power allows you to get up to soaring altitude without having to expend all that energy running up and down steep hills with a wing on your back. And just between you, me and the brass rail, Sammy, the thought of jumping off some stupid cliff never did appeal to me that much, anyway. All in all, it's the perfect arrangement to compensate for the local lack of mountainous terrain."

"That's not exactly what I meant," Sam persisted. "I was thinking that with all the controlled airspace in this area, it must be difficult to find enough room to keep from violating someone's territory."

"Oh, but that's the beauty of the whole thing, my fledgling flyer," rebounded the Bibulous Imbiber, slurping down the last of his legendary libation. "You see, Sam, I happen to know that these ultralights don't really come under the purview of the duly constituted controlling agencies of the airways. There's not any license required to operate them and they're uncertificated. Heck, you don't even have to register 'em! That means I can fly one anywhere the four winds blow—free as a bird." Waxing philosophical, the would-be ultra-light flyer continued extolling the virtues and advantages of the sport. "Free as the wind with not a care in the world—like an eagle soaring through the footless halls of space." With that, C.R. stretched out his arms in mock flight, nearly losing his balance from the lofty perch of his bar stool. "And no one to tell you where to fly, or how high, or how fast," he added with emphasis. "It's goodbye to the various burdensome controls and restrictive regulations that we Air Force flyers labor under. It's flying the way it oughta be, Sam! The way it used to be," C.R. concluded with a glowing smile, as if he had just seen a

vision of the Wright Brothers' first flight, Lindbergh landing in Paris, and General Jimmy Dolittle's Tokyo raid all rolled into one tableau.

"I don't know, Boss," Sam countered. "Sounds a little too loose for me."

"That's just the problem with you young whipper-snappers," retorted the Clown Prince of Pilotdom with a wry smile. "You're not old enough to remember the good ol' days when flying was simple and free and nobody was hogtied with all the trivial regulations and airspace restrictions we have to contend with now."

"Could be," allowed Sam. "Anyway, it *is* an interesting contraption," he observed, gazing at a photo. "Even reminds me a little of the early airplanes, what with the cloth covered wings, guy wires, wooden prop and wide open cockpit. Wouldn't mind seeing one fly in person sometime."

"Well, come with me tomorrow and you'll get your chance, ol' buddy," C.R. proffered. "I take my first ride bright and early in the morning."

"Count me in, Boss," Sam said enthusiastically.

"Mr. Mixologist, another Terrorific 'tini and a sarsaparilla for my pardner here if you please," C.R. drawled as the two barroom barnstormers kept pouring over the pictures and performance specifications.

"Come on, Sam," C.R. prodded. "Don't want to be late for my premier micro-flight."

Sam quietly closed his front door, hustled down the walkway and slid into the passenger's seat of the Magnificent Major's newly waxed Jaguar roadster. The first shafts of sunlight were just peeking over the roofs of the houses on the east side of the street. During the short trip north of town, the Overconfident Operator laughingly recapped the briefings he had received from "Dealer Dan, the ultralight man" a couple of days before.

"Oh, yeah," C.R. recalled. "Dan even tried to go over some basic piloting stuff. Can you imagine that? And he told me to be sure and read part 91 of the Federal Aviation Regs, but with my high level of knowledge and experience, he was wasting both our time. It's doubtful whether he could tell me *anything* about flying I don't already know," boasted the Immodest Major.

Before you could say British racing green, the dynamic duo roared up to the ultralight dealership. The place was already buzzing with activity, and half a dozen of the flimsy-looking flying machines were parked on the lawn, their brightly colored wing panels glittering in the sun. Sam spotted one being warmed up on an adjacent grass field that also served as the runway.

"Hello there, Major Terror," greeted Dan. "We're just about ready to test hop your machine. I'm gonna do the honors myself. Got to make sure the harness is adjusted for the correct center of gravity and the engine is operating properly. Can't be too careful, you know, especially during the break-in period."

Soon, Dan was strapped in the hanging harness seat and with a single pull of the starter cord the already warm two-stroke engine came to life again with a muffled buzz. The pusher prop created a respectable breeze to the rear where C.R. and Sammy stood watching. Without any hesitation, the pilot advanced the throttle and began moving forward with surprising acceleration. After a mere 60-foot roll, the airplane suddenly became airborne when Dealer Dan pushed his body back to initiate rotation.

"Wow, that thing gets off in less distance than the length of my back yard," Sam estimated, obviously impressed.

"And if you have a headwind, it's even shorter," added C.R.

The small craft flew as advertised, and the experienced ultralight pilot expertly shifted his body position to control pitch and roll with surprising responsiveness, especially for a flying machine traveling only 35 mph. Coming in for an approach, he cut the power 50 feet above the field, dropped the nose and aimed at the spot in front of where C.R. and Sam stood. As the aircraft glided to within 6 feet of the ground, Square-Deal Dan pushed back in the harness, causing the plane to flare and reducing touchdown speed to a brisk walk, so that he rolled to a stop right in front of the two visitors.

"He makes it look so easy," commented Sam.

"It looks easy because it *is* easy," corrected C.R., a gleam in his eye like that of a small child seeing bigger kids zoom by on bicycles and straining with desire to do the same.

"But the way he shifts his body weight to make the plane pitch and bank," challenged Sam, shaking his head. "Doesn't that seem alien to a stick and rudder man like yourself?" Unintentionally, he had probed and inadvertently nudged a nerve in the Great One's vanity.

"They have yet to make the machine that I can't fly, Sammy. Besides," brightened the quick-witted Warrior, "haven't you ever

heard of flying by the seat of your pants?" C.R. punctuated his point with a little wiggle of his prominent posterior.

"Okay, Major," said the test hopper. "Everything looks good, so if you're ready we can begin your flight instruction."

"I'll say I'm ready," proclaimed C.R. "Let's get on with it."

"Okay, first I want you to taxi around awhile to get the feel of the machine, especially using the weight shift to make it turn on the ground."

It was quite a sight to watch the Microlight Menace in his gold motorcycle helmet, pilots' sunglasses and, of course, a white scarf fluttering behind, perilously close to the whirling pusher prop. Speeding around the grassy field, he looked very much like a mustachioed munchkin in a winged go-cart.

As soon as C.R. could make a turn without running off the edge of the open area, he progressed to applying full power, accelerating to just below takeoff speed, shifting his body weight back to simulate takeoff rotation, then easing back on the throttle for a practice roll-out. "This is a piece of cake," he announced after several successful practice runs.

"Do you feel like trying a crow hop," asked Dan, as C.R. taxied to a stop.

"Sure," said C.R., firmly, "What's a crow hop?"

"Remember from the briefing?" prompted the instructor, "That's when you accelerate at full throttle, rotate and ease forward, keeping the aircraft a foot or so off the ground. Then reducing throttle, you push back for the flare and touchdown. Remember though, it's very important to ease forward just after the main wheels leave the ground so you don't gain more than a couple feet of altitude. Have you got all that, Major?"

"Roger-dodger, full throttle, lean back, take off, cut power and flare, right?" C.R. summarized.

"That sounds about right, Major, only remember to level off just above the ground."

"No sweat," entoned the Eager Aviator. "Let's get on with it," he added, his mind obviously already in the clouds. So, with a "tally-ho," C.R. headed for the far end of the field to start the crow-hop maneuver. The small engine buzzed and the prop made a smooth whirring sound as the Master Manipulator accelerated toward the spot adjacent to where the two witnesses were standing, along with a few other casual observers who had gathered.

"Here he comes," Sammy said excitedly. "He's already pushed himself back and the nose wheel is coming off the ground."

"Yeh, looks good so far," observed Dan cautiously. The main wheels came off the ground just as C.R. passed the bystanders. The Micro-lighting Major slowly turned his head to the left toward the onlookers, smiling like a Cheshire cat as the nose rotated skyward.

"Level off," Dan shouted at C.R. as he whizzed by in a very nose-high altitude. "Lean a little forward," he added in vain as the newly Airborne Airdale kept on climbing. "Oh, no!" yelled Dan, both hands slapping the sides of his face. "He's got the sequence wrong. He's reducing power with a nose-high altitude.

By this time, C.R. was about 25 feet above terra firma and approaching the edge of the grass field, already too high to land within its confines. With no chance to build airspeed after takeoff, the small craft stalled out the instant he reduced power. It's nose dropped suddenly and it looked like C.R.'s first flight would end in a pile of bent aluminum and fabric twisted around his tubby torso.

"He's going to crash," shouted Sam as the plane headed almost straight down toward the roughly plowed field. But just when it looked like the Careening Clown would surely buy the farm, he suddenly cobbed the power to the engine and leaned back in the harness as far as he could. Flaring the miniplane abruptly, he skimmed mere inches above

the big dirt clods with his feet dangling below the undercarriage and furiously pedaling the air. Miraculously, he finally gained a few feet of altitude, and although the sigh of relief from the onlookers was audible, their eyes were still glued on the spectacular exhibition of errant aviating before them. They watched as C.R. went through a couple more gyrations in the pitch and roll axes, barely avoiding a tree line at the far end of the farm field. Finally, though, he apparently got the "hang" of the control movements and began climbing steadily toward the west, slowly disappearing in the distance.

"Well, he survived the take off, even if it was unscheduled," Dan said with obvious relief. "But where the heck is he going?" he wondered aloud in Sam's direction.

"Dunno," replied Sam, "but isn't the municipal airport in that direction?"

"It sure is," groaned Dan. "He must have been asleep when I talked to him about airspace restrictions and general safety rules. I sure hope he's got enough sense to stay clear of the control zone."

"Don't count on it," said Long Suffering Sam, trying to explain his mentor's unsafe propensities. "When he gets in the air he tends to be in a world all his own sometimes. And with the airport motel swimming pool swarming with bathing beauties, I suspect he'll swoop down for a bird's eye view," he added with a note of assured resignation.

"Well," observed the miffed microlight manager, "If he keeps heading in that direction, he'll find himself sharing his world with B-737s, DC-9s and whatever else they have in the pattern."

The gathering of onlookers slowly dispersed. Only stalwart Sam remained to keep the vigil for his Obstreperous Overlord.

For almost an hour, Sam waited at the edge of the field. Finally he saw a speck pop up in the distance above the tree line and made out the buzzsaw-like engine noise. "It's him," he shouted, as the plane came close enough for Sam to discern the white scarf still fluttering in the slipstream.

As the diminutive aircraft lined up for a dragged-in final approach, the small group regathered around Sam to greet the returning Rogue who had, after all, "mastered" the sport in one fell swoop. The Master Microlighter kept the power up until he was almost on the ground, then gently flared by easing his considerable weight aft at just the right moment for a smooth touchdown. Stopping in front of the onlookers, C.R. shut off the engine and relaxed silently in the harness. The others gathered around to congratulate him on returning from his first flight apparently unscathed. Slowly, the now-seasoned soloist pulled off his helmet and unfastened the shoulder harness and leg straps.

"You okay, Boss?" inquired Sam.

"Why of course," rebounded C.R. "But something's got to be done about those bigger and faster airplanes not yielding the right of way to us slower glider-types. A twin-engine prop job almost knocked me out of the sky with its wake turbulence. And that airliner must not have seen me until the last minute. I had to dive down just above the trees to escape becoming a piece of FOD for some fan jet. If it weren't for my considerable aerial skill I might not have made it back at all."

Just then Square Deal Dan came jogging up. "Glad to see you're okay, Major, but there's a guy on the phone who says he wants to talk to you. He really sounds torqued.

"Who could that be?" wondered the Errant Aviator aloud.

A few minutes later, a crestfallen C.R. stepped out of the office shaking his head in doleful self-deliberation. "Sam, did you know that the airport manager is none other than my old squadron commander, Colonel Rudder?"

"Sure didn't," Sam confessed.

"Well, he is all right, and he happened to be looking through his 85mm binoculars about the time I 'inadvertently' skirted the traffic area on my way to the airport motel to check out the action poolside. I tried to explain to him that I thought I was far enough away from the traffic pattern to keep out of everybody's slipstream but he wouldn't listen to reason. He threatened to send a letter to the wing commander with info copies to the FAA. He even had the nerve to say I was as big a hazard to general aviation as he remembered I was to military flying. Can you believe it, Sam, him saying that to the world's foremost flyer?"

Sam was silent for a while before speaking up, "Well, look on the bright side, Skipper. At least you did get to soar like an eagle today."

"Yeah, but this is one lone-eagle who's whole day was nearly spoiled by those turkeys that inhabit all the over-regulated controlled airspace around here."

Knee Bends

The C-141 crew prepared for a high-altitude-low-opening (HALO) mission by prebreathing 100 percent oxygen for over 30 minutes to help denitrogenate their blood. Despite this preventive measure, the loadmaster suffered sharp pains in both knees after about an hour of unpressurized flight at FL 250. An immediate descent was started and the mission aborted. The loadmaster's pain subsided as the cabin altitude reached 16,000 feet, and back on the ground the flight surgeon's examination showed the young sergeant to be in good condition.

The medical evaluation did, however, point to some important factors which contributed to the loadmaster's uncomfortable experience with evolved-gas dysbarism. During the 48 hours before the HALO mission, he had slept only nine hours, with only three hours of rest occurring just before his 0430 show time. He also had to do some physically demanding work during the mission to resolve a problem with opening the Starlifter's ramp and pressure door. His self-imposed stresses teamed up with the physical demands of hard labor in a low-atmospheric-pressure environment to bring on the bends.

QUICK ST

Notable Quote

Communication is the process of accurately transmitting meaning from one mind to another.

-- Major General Jerry R. Curry, US Army
Deputy Assistant Secretary of Defense for Public Affairs

OPPERS

Heart Stopper

The Navy P-3 crew had nearly completed their night mission with only a radar approach, landing and taxi back to the blocks remaining to do. Had it not been for a heads-up copilot, however, termination of the flight might have been tragic instead of routine.

The runway was sighted before the controller told the pilot to begin descent on the GCA glide path. At three miles on final, they were cleared to land, and inside of one mile, landing flaps were selected and the pilot transitioned to visual references. Just as the landing flare was started, the copilot yelled, "Aircraft on the runway!" The AC immediately started a go-around. At 100 feet AGL, the P-3 passed slightly to the left of a commercial C-130 which had taxied onto the runway without clearance.

If the Orion had touched down, it could not have been stopped before hitting the Hercules. Sharp vigilance and decent visibility enabled the P-3 crew to spot the other aircraft on the runway and avoid the collision.

—Adapted from *USN Weekly Summary*

Twisted Tail Scrape

Usually when MAC crews damage the tail of an aircraft, it's the underside that takes the hit on landing, but a C-9 crew accidentally added a new twist to the "average" tail scrape story.

The Nightingale crew landed at a civilian field to deliver their airplane for repainting. They followed behind a service truck which led them to a hangar that was open at both ends. The truck drove through the hangar, but the crew stopped the airplane outside. Soon a marshaller and two wingwalkers appeared and waved the C-9 into the open bay. The pilot was a bit doubtful of the clearance and signaled by pointing to the aircraft T-tail that he wanted someone to see if it would clear the top of the hangar doorway. The marshaller, who was also the shop foreman, indicated that the tail would fit into the building, so the C-9 was taxied in.

You guessed it! post flight inspection revealed a scrape on the upper surface of the elevator which was made when it contacted the superstructure of the hangar. Pilots usually develop a good "feel" for their aircraft's width and length. In this case, going with his "feelings" would have saved the pilot extreme embarrassment and the Air Force the repair costs. Have you ever given much thought to how *tall* your flying machine is?

Lightning Strikes Twice

A C-130 recently received two separate lightning strikes in rapid succession while flying above building cumulus clouds, but well clear of any cells. However, the Hercules was operating in precipitation, turbulence and an outside air temperature of 8° C.

The lightning bolts temporarily attached themselves to the aircraft radome and the center wingbox area. In a fraction of a second, the forward strike poked a pin hole in the radome and delaminated part of its interior. The hit further aft blew off 30 feet of HF antenna wire and the rear antenna coupler. Fortunately for the crew, the strike didn't cause electrical failure or fire, destroy any radios or navaids, or ignite the fuel vapors in the wing tanks.

If you don't want to get your aircraft struck by lightning, don't fly it into conditions that are ripe for electrostatic activity. The highest *probability* of a strike is when you're flying in precipitation and turbulence with an outside air temperature of plus to minus 8° C, but remember, you don't even have to fill all the squares to get zapped.

Finstall Found

On takeoff, during a training mission, the C-130 IP announced a simulated fire indication for number one engine as the Hercules was passing 550 feet AGL and 140 knots. The right-seater retracted the gear and added right rudder while the left-outboard throttle was retarded. However, engines two, three and four remained set at maximum climb power and the copilot added full right rudder and right aileron to try to keep the Hercules going straight in coordinated flight. By now the C-130 was in a 15 to 20 degree left yaw and the turn-and-slip ball was pegged on the right side of the case.

Noticing the pilot was having some difficulty, the IP attempted to push the right rudder further in, but found it completely deflected. He then saw the yaw angle increase to about 45-degrees left and felt a buffet in the airframe. Recognizing the "classic" symptoms of uncontrollable sideslip, also known as fin stall, the instructor took the aircraft, neutralized the controls, retarded the throttles and lowered the nose. The Hercules flew out of the stall, and at 200 feet AGL and 120 knots, the IP added power to all four engines and regained complete control of the C-130. A more serious loss of control was avoided because the IP recognized the problem, took corrective action, and had the time and altitude to recover.

AFTER DEADLINES

MAC SAFETY OFFICER WINS TOP AWARD. AFISC recently announced Lt Col Dwight A. Sweet as the winner of the 1980 Chief of Staff Individual Safety Award. The award recognizes Lt Col Sweet's outstanding contributions to accident prevention as Chief of Safety, 314th Tactical Airlift Wing, Little Rock AFB, Arkansas. He is currently assigned to the Directorate of Command and Control, Headquarters MAC. Congratulations!

THREE NEAR MIDAIR COLLISIONS in recent months happened *after* radar controllers issued traffic advisories to MAC aircrews. In each case, the crew didn't see the conflicting traffic, but *did not* request avoidance vectors. Aircrews must use radar services when necessary to avoid other aircraft which they cannot see and avoid. A midair collision after traffic advisories were issued would be doubly tragic.

NEW EASY-TO-READ WEATHER MANUAL is now available. The 64-page handbook for aircrews covers weather codes, charts, services and hazards. Key points are accented with excellent pictures and illustrations. If your flying unit doesn't have AFM 51-12, Volume II, "Weather for Aircrews," available, it can be ordered from the PDO.

AMERICAN LEGION HONORS STARLIFTER PILOT. Captain Raymond F. Haile received the 1980 Aviator's Valor Award for his successful handling of an inflight emergency aboard a C-141. When a jammed aileron caused an uncommanded roll after takeoff on a training mission, Captain Haile took control and stabilized the plane. After three hours of troubleshooting he landed the Starlifter safely. Captain Haile and his crew from the 438th Military Airlift Wing, McGuire AFB, New Jersey, won MAC Safety Awards for Excellence in Airmanship in 1980 (see July 1980 *TMF*, page 18).

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SWALLOW YOUR PRIDE
and
SAVE YOUR HIDE